

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1, 3-7 and 10-21 are pending in this application. Claims 1 and 6 are amended, Claims 2, 8, and 9 are canceled without prejudice or disclaimer, and new Claims 10-21 are added by the present amendment. Amended Claims 1 and 6 and new Claims 10-21 are supported by the original claims and specification,¹ and therefore add no new matter.

In the outstanding Official Action, the drawings were objected to; the specification was objected to; Claims 8-9 were rejected under 35 U.S.C. §112, first paragraph; Claims 1-9 were rejected under 35 U.S.C. §112, second paragraph; Claims 1-9 were rejected under 35 U.S.C. §103(a) as unpatentable over Harazaki (U.S. Pat. No. 6,137,901) and in view of Inoue (U.S. Pub. No. 2002/0142233) and further in view of Takahashi (U.S. Pat. No. 5,948,573).

Initially, applicants and applicants' representatives thank Examiner Ruggles and Supervisory Patent Examiner Huff for the interview held on May 13, 2005 to discuss the present case. During the interview, proposed amendments for overcoming the outstanding rejections under 35 U.S.C. §112 were discussed, as well as differences between the claimed invention and the cited references. The Examiners agreed to reconsider the rejections after formal submission of the present Amendment

With regard to the objection to the drawings, Figure 11 is amended to delete the second occurrences of "MS12," "MS13," and "MS23" and replace them with "MS21," "MS31," and "MS32," respectively. As descriptions of "MS21," "MS31," and "MS32" are included in the pending specification, no corresponding amendment to the specification was necessary. Consequently, the objection to the drawings is believed to be overcome.

¹See, e.g., Specification at page 9, lines 8-13, page 11, line 18 to page 12, line 1, and page 15, lines 5-20.

With regard to the objection to the specification, the specification is amended to correct informalities, including the informalities cited in the outstanding Office Action. No new matter is added. Consequently, the objection to the specification is believed to be overcome.

With regard to the rejection of Claims 8 and 9 under 35 U.S.C. §112, first paragraph, Claims 8 and 9 are canceled, making the present rejection moot. New Claim 10, which includes the subject matter of original Claim 8, recites an embodiment of the present invention described, for example, in the specification at page 15, lines 5-20. New Claim 16, which includes the subject matter of original Claim 9, recites an embodiment of the present invention described, for example, in the specification at page 9, lines 8-13. As new Claims 10 and 16 are supported by the original specification, it is respectfully submitted that new Claims 10 and 16 are in compliance with all requirements under 35 U.S.C. §112, first paragraph.

With regard to the rejection of Claims 1-9 under 35 U.S.C. §112, second paragraph, Claim 1 is amended to recite that the first correction is made in accordance with (i) a space between said mask pattern and an adjacent mask pattern thereto, and (ii) a desired configuration to be transferred from said mask pattern. Claim 6 is amended to recite "a size by which said photomask is divided into said plurality of regions is selected for each correction factor." Amended Claim 6 is supported by an embodiment of the present invention described, for example, in the specification at page 11, line 18 to page 12, line 1. Accordingly, it is respectfully submitted that Claims 1 and 3-7 are in compliance with all requirements under 35 U.S.C. §112, second paragraph.

With regard to the rejection of Claim 1 under 35 U.S.C. §103(a) as unpatentable over Harazaki in view of Inoue and further in view of Takahashi, that rejection is respectfully traversed.

Amended Claim 1 recites a method of correcting a photomask comprising:

- (a) calculating a first correction for correcting a configuration of a mask pattern of said photomask in accordance with:
 - a space between said mask pattern and an adjacent mask pattern thereto, and
 - a desired configuration to be transferred from said mask pattern;
- (b) dividing said photomask into a plurality of regions;
- (c) calculating a second correction of said configuration of said mask pattern of said photomask in accordance with an occupation rate of said mask pattern in each of said plurality of regions, said first correction having an effect in a smaller range than said second correction; and
- (d) correcting said photomask based on said first correction and said second correction.

Harazaki describes a method for making a *single* correction to a photomask to correct for errors due to the optical proximity effect.² Accordingly, it is respectfully submitted that Harazaki does not teach or suggest a comparison of any kind between the described correction and any other correction, much less a comparison of ranges of two different corrections. Thus, it is respectfully submitted that Harazaki does not teach or suggest “said first correction having an effect in a smaller range than said second correction,” as recited in amended Claim 1.

Inoue describes a method for making a *single* correction to a photomask based on the pattern density.³ In a similar manner, it is respectfully submitted that Inoue does not teach or suggest a comparison of any kind between the described correction and any other correction, much less a comparison of ranges of two different corrections. Accordingly, it is respectfully submitted that Inoue does not teach or suggest “said first correction having an effect in a smaller range than said second correction,” as recited in amended Claim 1.

²See Harazaki, Abstract.

³See Inoue, paragraph 13.

Takahashi discloses a method for minimizing a “dishing” effect when chemically/mechanically polishing an insulator layer deposited on a substrate.⁴ The “dishing” effect, shown in Figure 17D of Takahashi, is a mechanical effect that occurs due to the difference in pattern densities of different portions of the mask pattern. Takahashi solves the problem of the “dishing” effect with a mechanical solution, namely including dummy patterns 13, shown in Figure 3D of Takahashi, to even out the pattern density. Although page 8, lines 10-13 of the outstanding Office Action cites column 15, lines 8-13 of Takahashi as describing “said first correction having an effect in a smaller range than said second correction,” it is respectfully submitted that this portion of Takahashi merely describes that before adding the dummy patterns, the pattern density may vary greatly between different regions of the photomask. Multiple corrections are not described, nor are any comparisons of ranges of two different corrections. Since at most Takahashi discloses making a *single* correction to a photomask, it is respectfully submitted that Takahashi does not teach or suggest “said first correction having an effect in a smaller range than said second correction,” as recited in amended Claim 1.

As none of the cited references teach or suggest “said first correction having an effect in a smaller range than said second correction,” amended Claim 1 (and Claims 3-7 dependent therefrom) is believed to be patentable over the cited references.

New Claims 10 and 16 also recite in part, “said first correction having an effect in a smaller range than said second correction.” Accordingly, new Claims 10 and 16 (and new Claims 11-15 and 17-21 dependent therefrom) are also believed to be patentable over the cited references.

⁴See Takahashi, column 1, line 56 to column 2, line 8 and column 15, lines 18-36.

Accordingly, in view of the present amendment, no further issues are believed to be outstanding and the present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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IN THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 11. Figure 11 is amended to delete the second occurrences of “MS12,” “MS13,” and “MS23” and replace them with “MS21,” “MS31,” and “MS32,” respectively.

Attachment: One Replacement Sheet